Standardization and the European Standards Organisations

Marta Orviska, Juraj Nemec and John Hudson
Matej Bel University, Masaryk University
Brno, University of Bath

Abstract: *Standardization is a relatively neglected aspect of the EU regulatory process and yet it is fundamental to that process and arguably has recently been the key vehicle in making the single market an economic reality. Yet the key standardization bodies in the EU, the ESOs, are scarcely known to the public and seldom discussed in the literature. In this article we redress this imbalance, arguing that standardization and integration are closely related concepts. We also argue that the ESOs have developed a degree of autonomy in expanding the boundaries of standardization and even in developing their own links with the rest of the world. Recent proposals put forward by the European Commission can be seen as an attempt to reduce that autonomy. These proposals emphasize the speed of, and stakeholder involvement in, standards production, which we further suggest are somewhat conflicting aims.*

Keywords: *standards, CEN, ETSI, CENELEC, ESOs.*

MARTA ORVISKA – Faculty of Economics, Matej Bel University, Banska Bystrica, Slovak Republic[1]

JURAJ NEMEC – Faculty of Economics and Administration, Masaryk University Brno, Czech Republic[2]

JOHN HUDSON – Department of Economics, University of Bath, UK

1 Correspondence concerning this article should be addressed to Marta Orviska, Faculty of Economics, Matej Bel University, Tajovskeho 10, 975 90 Banska Bystrica, Slovak Republic, E-mail: marta.orviska@umb.sk.

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INTRODUCTION

Over the years, there has been a focus on the EU's 'neglected' institutions (Stein, 1981; Robinson, 2009; Martens, 2010). In this article we continue this by examining the role, functions, impact and evolution of the European Standards Organisations (ESOs). These are less visible than most EU institutions and, e.g. are ignored in regular Eurobarometer surveys. Indeed the ESOs themselves would argue that they are private bodies, not public institutions. Partially as a consequence, Kerwer (2005) argues that in many respects political science, and this is also true for other social sciences, is ill-equipped to analyse many of the issues surrounding standardization due to a lack of awareness of what exactly standards and standardization entail. Standards cover a wide variety of areas including the size of paper, food safety, the technology, and even the size, of ATM cards, labour laws and more technical standards which, e.g. underpin GSM[3] and the Internet. Standards can be *de facto* or *de jure*. *De jure* standards tend to be the product of committees or formal standards setting organisations (SSOs)[4] and have been at the heart of the integration process in the EU from 1985 onwards following the introduction of the 'New Approach' to standardization. At the time, formal regulation required agreement between 10 member states. The EU turned to standards, which were viewed as voluntary, as a mechanism to bring about the conditions necessary for the single market to function at a time when formal regulation appeared difficult to achieve. They have also been used to ensure the interoperability of networks and systems, to enhance consumer and environmental protection, and to facilitate innovation and social inclusion (European Commission, 2011). This has led to an enormous growth in the number of standards and the work of the ESOs. They are part of a regulatory framework which, because of their rapid growth, represents what has been termed new modes of governance (Borras et al., 2007).

3 The Global System for Mobile Communications.

4 Or, alternatively, standards developing organizations (SDOs).

Table 1 Terminology

CEN	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardization
CWA	CEN Workshop Agreement, a technical agreement developed in an open workshop framework under the auspices of, and owned by, CEN. It reflects the consensus of the individuals and organisations associated and a lower level of consensus and transparency than an EN.
EN	Voluntary technical standards developed by an ESO
ESO	European Standards Organisation
ETSI	European Telecommunications Standards Institute
GSM	The global system for mobile communications
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
JTC1	A joint technical committee of ISO and IEC
NSO/NSB	National standards organisation (sometimes referred to as national standards body or board)
SSO/SDO	Any standards setting/developing organisation
TCs/TBs	Technical Committees or boards of SSOs where the detailed work on standards is done
TS	An ETSI Technical Specification approved for publication by a Technical Body. The aim, as with Technical reports, is to deliver 'high quality' specifications quickly. This contrasts with an ETSI standard approved by the whole ESI membership.
UMTS	Universal Mobile Telecommunications System: A third generation (3G) mobile phone technology. Designed to succeed the GSM standard.
W-CDMA	Wideband Code Division Multiple Access, a type of 3G cellular network. It is the high speed transmission protocol used in the UMTS system.

Source: Authors.

In this article we will examine the process of standardization in Europe, thus filling the gap noted by Kerwer (2005), not just with respect to political science but for the social sciences in general. Within this context, the key research questions we will be seeking to answer are: What is the relationship between the EU and the ESOs and how is this relationship evolving? These are particularly important questions given the impact standards can have on both innovation and integration. But they are also particularly interesting questions

given that the ESOs are private, rather than public organizations, who nonetheless play an important role in the governance of the EU. In pursuing this, we will argue that standardization and the growth of the ESOs have both facilitated and contributed to EU integration, while changing the role of national standards organisations (NSOs). The ESOs are independent bodies, in effect making policy as what has been termed a fourth branch of government. However, we will also argue that the European Commission is now attempting to increase its level of control over the ESOs and in so doing increase their accountability. The process is an ongoing one and we will further argue that the Commission's aims of both speeding up and opening up the process of standardization conflict with each other and a largely compromise solution must be found, although it need not be the same compromise at all times and in all circumstances.

The article will proceed as follows. In the next section we will briefly review some of the relevant literature relating to standards. In section 2 we will outline the process of standardization in the EU. In the third section we will argue that standardization and integration are related concepts, before moving on to discuss recent and ongoing reforms to the standardization process and ESOs. Finally we will conclude the article. This is a technical subject made more confusing to the outsider by the use of acronyms. A summary of some of those used can be found in Table 1.

STANDARDS AND STANDARDIZATION

The standards with which we are concerned are formal *de jure* standards recognized, developed and administered by one of the ESOs. However, standards can also be *de facto*, established as a result of market dominance. An example would be Microsoft Windows which is, Apple apart, the dominant platform for software engineers, just as IBM set an earlier standard for PCs. These positions were achieved not by consensus and discussion, but by the dominance of these companies in their respective markets, a dominance which in itself became a positive attribute for buyers. Important pieces of literature have analyzed this process (David, 1985, Farrell & Saloner, 1985), showing that if standardization is left to the market alone, the outcome may be unsatisfactory in several respects. Under the conditions of positive network externalities affecting market-driven processes of standardization, "bandwagon" phenomena can result in premature commitment to standards that will inhibit continuing innovation and cause a "lock-in" to inferior technologies. Apart from this, there is, of course, the problem of monopoly power when one firm, or a small group

of firms, gains control of a standard. David and Steinmueller (1994) note that there are anti-competitiveness effects potentially arising from one or more incumbent firms being able to internalize differentially higher costs than their rivals, which may even deny the latter market access. Egyedi and Hudson (2005) analyse the case when a private standard developer can write a specification to their advantage rather than the market's, a specification which can be particularly aimed at damaging rivals. Standards can also arise through private sector firms acting together. But David and Shurmer (1996) argue that there is a danger that private consortia will omit public interest safeguards that are written into the more formal, *de jure*, standardization process. Coordination failure may also result in no standard emerging and innovation slowing down, as happened in the European colour television market in the 1960s (Austin & Milner, 2001; Abbott & Snidal, 2001).

Many of the above arguments provide a rationale for formal standard setting and hence a role for the ESOs. However, some economists hold that *de facto* standards are likely to give the best results because they have the advantage swift adoption (Farrell & Saloner, 1988). The periods involved in formal standardization can be very long, up to seven years for ISO. Timescales have, however, shortened in recent years, and CEN has had a "3-year timeframe" for standards development since 2002, with three years too in JTC1. But standards related to new product or process development, in particular, and more generally standards related to industry, require *rapid*, focused procedures that must satisfy both product developers and end users (Cargill, 2001). Lengthy delays will also have a particularly serious consequence for the ESOs' ability to forestall the emergence of *de facto* standards – which may, of course, be what some of the ESO committee members want. These concerns are at the heart of recent criticisms of the ESOs by the European Commission (2011)

Nor can standards delivered by committees, and this includes ESO standards, be guaranteed to be optimal. If all the participants do not have the same preference function or objective function, then there are no perfectly satisfactory choice procedures (Arrow, 1951). In other words, once interests diverge, the procedures for the choice of the standard will necessarily be sub-optimal. Given that many of ESOs' committees are made up of both representatives of competing producers and users, such divergence is almost inevitable. Voluntary standards setting organisations, including the technical committees (TCs) of the ESOs, are also subject to capture by representatives of major vendors because they have an advantage when it comes to undertaking the background R&D and providing expert personnel to work on the committees. Coalitions of existing producers can then use voluntary standard writing processes to issue product specifications that impose cost burdens upon rivals (David & Steinmueller, 1994). They also may circumscribe potential future competition by writing anticipatory standards that have the effect of channelling innovation into areas where they have control of complementary or basic technology through patents or other devices. In part, consumer and SME representation on standardization committees is encouraged to counter these possibilities. But this is a highly technical area. Expert committee members are nominated for their knowledge in the field concerned and there are still considerable differences in knowledge between the representatives of larger multinationals, in particular, and other representatives. This enhances the power and influence of the former. Much of non-technical standardization forms the basis for regulation. Membership in these committees offers these large firms the opportunity to influence not just the standard, but the regulation itself. This may be to the detriment of both the public and other, often smaller, firms not represented on the committees. It also raises potential problems of legitimacy if people consider standardization to be led by an elite group of scientists sponsored by large firms. The perception may be that in this process the wider interests of the public will tend to be ignored. As we will see later, this particular concern has led the European Commission to propose changes which will enhance stakeholder participation.

EUROPEAN STANDARDIZATION

European Standardization Organisations

Within the EU there are three main ESOs, all non-profit making: (i) CEN, (ii) CENELEC and (iii) ETSI. CEN and CENELEC standardize aspects of all types of products, systems and services. Increasingly the 3 ESOs cooperate in accordance with their specialisation to develop a portfolio of standards needed by industry sectors and associated with specific technologies. CEN, the European Committee for Standardization, was founded in 1961 by national standards bodies in European Economic Community and EFTA countries. It currently has 33 national members. It focuses on voluntary technical standards which promote free trade, the safety of workers and consumers, the interoperability of networks, environmental protection, the exploitation of research and development programmes, and public procurement. It is, for example, responsible for air traffic management standards, automotive fuel standards, common structural rules for the design of buildings, the safety of consumer products, solid biofuels, food, healthcare, the conservation of cultural property, the Blue Flag award for clean beaches, etc. CENELEC, the European Committee for Electro-

technical Standardization, was created in 1973 as a result of the merger of two previous European organisations: CENELCOM and CENEL. It is composed of the national electrotechnical committees of 32 European countries. In addition a number of countries from Eastern Europe, the Balkans, Northern Africa and the Middle East participate in the work of both CEN and CENELEC as affiliates. CENELEC prepares 'voluntary' electrotechnical standards that help develop the European Market for electrical and electronic goods and services.

For both CEN and CENELEC, ICT represents a very small part of their work. This is more the province of the European Telecommunications Standards Institute (ETSI) who is mainly responsible for the standardization of information and communication technologies (ICT) within Europe. These technologies include telecommunications, broadcasting and related areas such as intelligent transportation and medical electronics. This activity is supplemented by interoperability testing services. ETSI has long been more open to direct participation by producers and consumers than CEN and CENELEC, whose TCs consist of representatives of NSOs (Goerke & Holler, 1998).

The European standardization system is based on the principle of national delegation. CEN and CENELEC are European organisations made up of national standards organisations (NSOs). ETSI, however, is based on direct participation of industry, without NSOs or other intermediaries. When CEN or CENELEC elaborate a new European Standard, they set up a European technical committee under the responsibility of one of its national members and consisting of representatives of other NSOs. At the same time, the NSOs create the so-called "National Mirror Committees" reflecting European TCs at the Member State level. This enables all interested parties (enterprises, consumers, public authorities, NGOs, etc.) to participate in the creation of the standard at national level and in their own language. These National Mirror Committees elaborate a national position for the drafting of and voting on a European standard, which is then presented at the European TC. The work done by ETSI is carried out in committees and working groups composed of technical experts from the Institute's member companies and organisations. These committees are often referred to as "Technical Bodies".

The ESOs have work programmes for standardization based on stakeholder needs, i.e. market needs. The European Commission may issue mandates, i.e. requests, for certain work including the development of standards. However, in the majority of cases the ESOs themselves start the development of a new standard through their TCs, 299 of which are currently active in CEN alone, playing a key role. The ESOs are in general not large organisations as such. Hence CEN staff costs in 2011 were €6.74 million and CENELEC's were €2.48 million. ETSI's were rather larger at €11.51 million; however, it performs

other functions than standard development such as interoperability testing. But through the TCs they can enlist the resources and knowledge of thousands of experts from industry, academia and other interested organisations. Hence their impact is much larger than their number of paid staff would suggest.

The ESOs are private organisations whose overall direction tends to come from a management or administrative board. Since 2009, the CENELEC has had a British President who has links with the British Association for the Electrical Industry. The President Elect is from Norway and there are vice presidents from the Netherlands, France and Italy. There are nine other board members from across the EU, including five from the most recent waves of EU enlargement. They tend to be recruited from either national standards bodies or industry and Siemens is notable in having members on the boards of both CEN (the President) and CENELEC (the President-Elect). The ETSI Board is composed of 25 elected members plus 5 ex-officio non-voting seats reserved for the Chairman of ETSI's General Assembly, the Director-General, the European Commission and the EFTA. Unlike the other two ESOs, ETSI's board is dominated by industry members, including several non-European multinationals such as Microsoft and Samsung. Hence the Board elected in November 2011 comprised delegates from Europe, China, North America, Japan and South Korea. In ETSI's own words, it may have been established originally to make standards for Europe, but the global application of its work now is obvious to all.

The definition of a standard provided by CEN/CENELEC is a "document established by consensus and approved by a recognized body that provides for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context".[5] European standards (EN) are documents that have been ratified by CEN, CENELEC or ETSI. A European standard gains the status of a national standard for all EU member countries. Implemented as a national standard, it automatically has precedence over and replaces previously existing national standards. To a considerable extent, national standards have been replaced by European standards implemented, at least in theory, identically Europe-wide. "Consensus" is officially defined in the ISO/IEC Guide 2 as "general agreement, characterized by the absence of sustained opposition to substantial issues by any important part of the concerned interests and by a process that involves seeking to take into account the views of all parties concerned and to

5 This same definition can also be found on the ISO and IEC web pages, as such it is not unique or specific to CEN/CENELEC.

reconcile any conflicting arguments".[6] Nonetheless, the definition also notes that "Consensus need not imply unanimity" and as final voting is based on a qualified majority this reference to consensus should not be interpreted as implying complete agreement, but a majority view and one based on a weighted voting procedure in accordance with the EU's Nice Treaty. In ETSI's case, companies have a voting weight determined by their membership fee which in turn depends upon their financial turnover.[7] More generally, in the ESOs the weights given to member countries are based on population. Thus it is possible that countries have to accept as their national standard something they voted against. It is also possible that under pressure to speed up the standardization process, this subjective consensus can easily be reduced, or lead to an increased use of instruments such as CEN Workshop Agreements (CWA) which require a lower level of consensus than an EN.

There are particularly close links between the ESOs and international SOs such as ISO and IEC, and many of the European standards stem from these. The Vienna Agreement of 1991 allows CEN to adopt ISO standards and vice versa, and the two organisations work closely together. Many people are on both of their TCs and there is feedback in both directions. Indeed the perception in the USA is that these two organisations are too close and has led to ISO adopting CEN standards (Winn, 2005), an outcome which was indeed planned under the Vienna Agreement. The technical experts in CEN and ISO tend to decide in which forum to develop standards, either in parallel or for subsequent adoption by the other organisation. The Dresden Agreement of 1996 has developed similar co-operation between the IEC and CENELEC and it is a 'strategic goal' of CENELEC to promote the IEC-CENELEC model, as set out in the Dresden Agreement, across the world. Thus in 2011 over 75 per cent of the standards CENELEC produced were either identical to or based on IEC standards, with the rest being "home grown". This is very similar to the proportion relating to the stock of standards which were either identical or very similar.

The New Approach

A European Council Resolution of 7th May 1985 formally endorsed the principle of reference to European standards within the relevant European regulatory work (Directives), thereby paving the way to 'a New Approach' – now almost thirty years old of course – in the philosophy of regulations and standards in Europe. This was intended to limit the regulatory function of the Commission and Council to specifying 'essential requirements' that producers must meet in terms of safety, health, environmental and consumer protection. Responsibility for developing standards was given to the ESOs. This has led to the proliferation of 'voluntary standards' that give products conformity with essential EU directives and thus access to EU markets (Mattli, 2001). The need to comply with such standards to gain such access means that in reality many are not voluntary (Blind, 2004).

The New Approach was committed to the principles of mutual recognition and the elimination of obstacles to the free movement of goods. The principle of mutual recognition is one of the foundation stones of the single market. It was developed by the European Commission on the basis of the European Court of Justice's "Cassis de Dijon" judgement and implies that no member state has the right to forbid the sale of any product from another member state, except under very special circumstances. In order to support this, member states need to have confidence in the quality and technical standards of all member countries. This is achieved by a 'Global Approach' to testing, certification and conformity assessment of 1989 which provides harmonized procedures to establish the conformity of products with certain "harmonized standards" from CEN, CENELEC and ETSI, references to which are published in the EU Official Journal. A "harmonized standard" is always a formal European Standard, with the additional feature that it provides the means to meeting (some) essential requirements in the relevant directive. Compliance with a European harmonized standard provides a presumption of conformity with the applicable requirements set out in the relevant EU harmonisation legislation. There are other ways of doing this and hence, as we have already noted, it is sometimes argued that the use of harmonized standards is still voluntary. The percentage of European standards that are harmonized increased from 3.55 per cent to 20 per cent in the two decades preceding 2009.

The New Approach has led to a substantial extension of EU responsibility and powers, rather than a reduction. As we shall see, the situation is evolving continually. The importance of national bureaucracies, governments and standards bodies, in some respects, is declining as the ESOs are (i) trying to reach out to embrace more directly the citizens and firms of the EU, (ii) moving away from consensus and (iii) steadily expanding their areas of influence, e.g. to cover services. In addition to this 'deepening' of influence, there has also been a 'widening'. Firstly, as the EU has grown, so too has the number of national members. But secondly, the involvement of EFTA brings the non-EU countries of Europe (Iceland, Norway and Switzerland) directly within the ambit of European integration and since the beginning of 2012, the Turkish standards body (TSE) became a full member of both CEN and CENELEC.

6 ISO/IEC Guide 2:2004. Standardization and Related Activities – General Vocabulary, see: http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=39976.

7 For a discussion of the way in which standards committees work, see Jakobs et al. (2001).

Examples of European Standards: GSM

GSM is the European standard for second-generation mobile communications developed by ETSI. Agreements on a number of aspects were required in its development, most critically choice of technology and a common frequency. On both issues there was some initial disagreement between both companies and countries. In this, timely acts of governance at EU level were critical (Pelkmans, 2001). Patents were a particular problem, in particular Motorola's who held 60 of the 130 involved. Motorola's initial perspective was that these should be employed strategically, which conflicted with the EU's view that all IPRs should be licensed in a fair, reasonable and non-discriminatory way.

To the EU it was an essential component of integration that one mobile phone technology would ensure connectivity throughout the EU. This both facilitated the development of the mobile phone market and gave EU manufacturers a competitive advantage in world markets as GSM's popularity spread well beyond Europe. This was in contrast to the USA where market forces were left to decide the standard, with the result that no single standard emerged, the growth of the market was slower and communication was hindered. In many respects it is one of the EU's success stories, although one Van Eecke, Da Fonesca and Egyedi (2007) describe as being the result of unique circumstances which are unlikely to be repeated. Despite this the EU was instrumental in developing W-CDMA, the very successful third-generation (3G) standard for mobile telecommunications (Bekkers et al., 2011). However, if ETSI continues to move away from being focused on the EU, the likelihood of a technical standard emerging which will hand an advantage to EU firms over their global competitors may decline.

Examples of European Standards: Food and Product Quality

The EU has an integrated approach to food safety which is designed to ensure effective control systems and compliance with EU standards (Hudson & Hudson, 2008). This covers how farmers produce food, how food is processed and sold and what information is provided on the labelling. The rationale for this lies partly with concerns about health and public safety, and partly with facilitating the single market. Underpinning this approach are more than 400 standards developed by CEN in the area of food safety alone as well as others related to general product quality. It has been argued that food is the arena relating to quality in which the influence of the EU has been the greatest and that the EU is the dominant actor in many EU countries, with the national state being 'the official mediator and interpreter of EU regulation' (Ferretti & Magaudda, 2006).

However, this interpretative role still leads to substantial differences between and even within countries. Current legislation also allows member states to adopt more stringent regulations beyond the required 'minimum harmonisation'. This diversity of regulations has resulted in added cost to businesses as they attempt to trade across borders and has also increased consumer uncertainty about buying products from other EU countries (European Commission, 2007). Partly as a consequence, the EU has recently been considering the need for further changes in this area. In part, as always, their concern is based on the need to promote trade and competition within the single market, but in part too they are concerned with consumer protection, a concern which has been given added significance following various food scandals.

EXAMPLES OF EUROPEAN STANDARDS: WEEE STANDARDS

The Waste, Electrical and Electronic Equipment (WEEE) regulations make producers responsible for their products when they become waste. Their aims include: (i) the reduction of WEEE disposal to landfill, (ii) provision of a free producer take-back scheme for consumers for end-of-life equipment and (iii) the setting and achieving of targets for recovery, reuse and recycling of different classes of WEEE. At the moment transposition of the WEEE directive into national law has revealed major differences from one legal system to another. Thus it has been recommended that the Directive should be revised to increase harmonisation (Savage, 2006). This has been under review and a recast directive published in 2012 broadens the scope and increases the requirements for equipment collection. Related to WEEE, the Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) has since 2006 put limits on the maximum permitted level of lead, mercury, cadmium, etc. in a product. By 2011 it evolved into RoHS II. Both of these updates further expand the role of the EU and of standards.[8] Both initiatives are also having an impact outside the EU. China's, Korea's and Turkey's implementation of RoHS legislation has built upon the EU's approach. Other countries are doing the same. The USA has no such regulations but certain states such as California are implementing them in some form. Underpinning this work on RoHS, WEEE and the environment in general is the work of a number of the ESOs' technical committees. For example, CENELEC TX 111X has developed the EN 50419: 2006 standard dealing with the marking of electrical and electronic equipment in accordance with the WEEE directive. In addi-

8 See: http://export.gov/europeanunion/weeerohs/rohsrevision/index.asp.

tion, there are a number of CEN TCs whose standards support the general objectives. Thus two TCs have been established in the areas of sustainability of construction works (CEN/TC 350) and the assessment of release of dangerous substances in construction products (CEN/TC 351).

Standardization and Integration: Two Sides of the Same EU Coin?

The above analysis has illustrated how EU standards affect all individuals and firms in the EU, and even beyond, in many different contexts. Standards have, certainly within the EU, become the favoured instrument for "soft" governance over and above a more legalistic approach, which raises the question of why this should have been the case. In part, as we argued earlier, it was a pragmatic move; the EU was faced with difficulties in passing detailed regulations aimed at breaking down technical barriers to trade. Hence the Council of Ministers decided that the harmonisation of legal requirements to determine the basic requirements be limited to the scope of 'guidelines' (Blind, 2004). They are also perceived as being fit for purpose and are part of a process promoted by the OECD (2003) of replacing consensus-based decision making with 'evidence-based decision making'[9]. This was at a time when there were only ten member states. Since then substantial expansion has been accompanied by changes in the EU's voting rules, but still standards play an important, and perhaps increasingly important, role within the EU.

Other writers have also associated the development of standards with the limits of the European integration project from the 1980s onwards. Keleman (2003) has argued that multiple veto players' participation in the EU's legislative procedures makes new legislation difficult to pass. According to Brunsson and Jacobsson (2000), the choice of standards rather than directives also initially stemmed from the difficulties encountered by European institutions in imposing compulsory measures. The recourse to standards was therefore a pragmatic response to the absence of any constraining means at the EU's disposal to accompany its regulatory activity – an absence for which the incentives linked to the application of standards could compensate. In part standards can play this role because of their scientific and technical base, which gives them a veneer of being determined outside the political arena[10] (Borraz, 2007) and thus a rationale for national politicians to ignore them and

9 Although official standards committees such as CEN offer the possibility, at least, that these two approaches can be combined.

10 The fact that they are regarded as private, non-profit organisations, rather than public sector ones, further enhances this perception.

users to accept them (Kerwer, 2005). They were initially perceived as being voluntary, but in reality, as we and others have argued, entail an element of coercion. This is the case to differing degrees for all standards, but particularly so within the EU.

However, standards have not simply facilitated European integration; they have been an active catalyst behind it. Their use has progressively opened up opportunities for a new, more integrated approach and they have became an instrument for supra-national governance of the European Union (Borraz, 2007). In part this is because much of the impetus for proposals for new standards comes from within the ESOs, who can thus be seen to be pushing forward the frontiers of EU integration. This is clear from the 2011 CEN-CENELEC annual report (p. 3) which states that:

> *"We continue to expand the horizons of European standardization by addressing new sectors and welcoming new stakeholders, helping them to understand the benefits of our system and how they can work with us to develop smart solutions that will meet their needs. Particular attention has been paid to the concepts of environmental performance, resource-efficiency and ecodesign. We have been active across an ever-wider range of sectors such as: space, maritime security, electrical installation of ships, sustainable cocoa, and services."*

Thus the ESOs are not simply responding to requests from the Commission and industry; they are actively seeking to expand the role of standards and thus their own role[11]. In doing so they have helped create a climate where it is accepted that the EU has a central role in the standardization process, with the ESOs providing a "matching" activity between the EU policy goals and the market. In this they have to a considerable extent replaced the NSOs, who now work together within the ESOs. The ESOs have also been actively seeking to engage with countries outside the EU. This is obvious with ETSI, but also CEN and CENELEC are using seconded experts in China, and India in future, to foster 'Europe's trade relations with these important markets'.

The growth of the ESOs has also been partly because of the growing importance of standards due to factors such as technological change and globalisation. The former results in new products, e.g. GM foods and nanotechnology,

11 It has been suggested to us that requests for standards come from stakeholders, these are treated by the ESOs, and there is no standardization work without stakeholder interest and need. To an extent this is true, but the above passage makes it clear that the ESOs are not just passively responding to stakeholder requests.

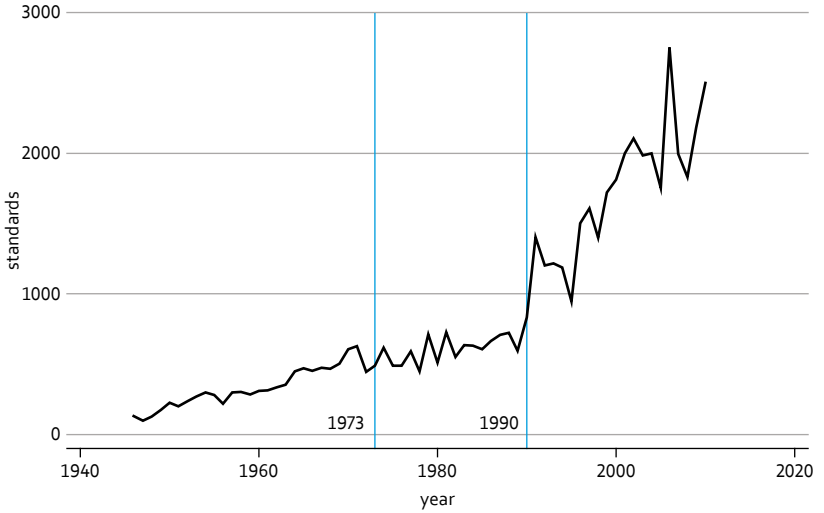
which need regulation, and as in the case of IT also require technical standards to ensure interoperability. For these and other reasons standards in general have a higher visibility than e.g. 20 years ago. Globalisation and growing interdependency in world markets have given impetus to international standards. GATT has called for international standards after identifying standards as a barrier to market entry and international trade. Thus we have seen an expansion in the role of other standardization bodies such as ISO, and standardization has moved into areas that were, at best, remote years ago (e.g. corporate social responsibility, sustainability, governance and other issues). But the growth of the ESOs has also been partially at the expense of the NSOs. Figure 1 shows the number of standards produced by the BSI over the period of 1946–2010[12]. There has been a steady increase, although in terms of 'British production' the figures are somewhat misleading. Thus in 1994–5 only 14 per cent of the standards were national in origin, 53 per cent came from the EU and 33 per cent were international, e.g. ISO[13]. The sharp jump in production in the early 1990s coincides with the introduction of the single market. Prior to that, the graph shows the rate of standards production growth slowing down. Since the introduction of the single market, not only has there been a shift upwards of the trend, but also an increase in its slope, reflecting increased activity by the ESOs[14]. The BSI emphasises the volume of standards produced in its Annual Reports, but this is not something that the EU is specifically considering as a measure of ESO performance. This is probably a good thing as it would set up an incentive to expand volume, which could potentially be achieved by devices such as splitting a standard in two, and focus attention away from the more difficult-to-produce standards to the easier ones.

12 This is the latest year for which data is available. The data was collected from the Annual Reports held at the BSI Library in London and more recently online. It should be noted that the British Standards Institute (BSI) standards have not been subject to much academic analysis, an important exception being Swann, Temple and Shurmer (1996).

13 Since then the BSI Annual report has been sparse in terms of information on these shares.

14 Although, of course, as mentioned earlier, other factors such as globalization, technological change and even climate change may also be impacting upon the growth of standards and in particular international standards.

Figure 1 BSI Standards produced 1946–2010



In 1973 the UK joined the Common Market; The Single Market was born in 1990

The role of the BSI has now changed and to a considerable extent is focused outwards, taking advantage of both its reputation, global links and membership in the EU and the ESOs. Thus in 2010, 19.3 per cent of its income came from UK sales, 36.6 per cent came from Europe and the Middle East and the rest was split equally between the Americas and Asia and the Pacific. Substantial income was generated from activities such as certification and training, rather than the sales of standards. This is in contrast with the earlier years when standards sales were a more important part of the business. The BSI now emphasizes its role in supporting the work of the ESOs and also the ISO. This is not to say that the BSI no longer produces new standards. It does[15], but even these tend to be aimed with half an eye on the global market. This outward focus is also reflected in the work of the other NSOs. For example, more than 85 per cent of the activities of DIN, the German NSO, are at the European or international level. The BSI is also an active, even enthusiastic, participant in the ESOs. For example, as of February 2010, it held 17 per cent of the European secretariats, compared to DIN's 30 per cent and France's AFNOR's 20 per cent.

15 The ISO9000 family of management of quality standards had their origin in the UK.

AN EVOLVING COIN

The world of EU standards continues to evolve, in part because the context within which the EU operates is changing. The economic crisis puts an even greater imperative upon economic growth than in the past. Because of the need to promote innovation and competitiveness, the EU is seeking to improve the speed with which standards are produced. It also wants to increase the legitimacy and inclusivity of their development. As part of this process the EU proposes to introduce an annual Work Programme which will identify strategic priorities for European standardization. One aim of this is to cut in half the average time it takes to develop standards by 2020. To ensure rapid delivery of standards, EU financial support of the ESOs will be conditional on meeting targets relating to the speed with which standards are delivered. Such conditions will also relate to the 'quality' of the standards and stakeholder representation in the process. The stakeholders relate to consumers and the environment as well as SMEs. However, the "national delegation principle" entails representation of the interests of all national stakeholders through the NSOs, and hence such involvement will need to be done via the NSOs. Thus, to a degree, CEN and CENELEC in particular will still be at arm's length from the stakeholders, which is important to the NSOs. Finally, under the proposed changes, the ESOs will be encouraged to improve their dialogue with private standards consortia, and use fast tracking procedures to bring their specifications into the European standardization system. The NSOs have some concerns with these proposals. DIN is particularly concerned with fast-tracking specifications developed by private consortia. It also believes that decisions regarding the organisation of standardization should remain in private sector hands, and hence is wary of greater control of the ESOs by the Commission.

The world is changing in other respects, too. Standards used to be primarily product standards, but are evolving more and more to include process and production standards and also standards for the service sector. As we emphasized earlier, standards in general have a much higher profile than 20 years ago. This, too, has enhanced and will further enhance the role and influence of the EU and the ESOs. In the future other changes are possible. There is concern with respect to the differential implementation of standards across, and even within, EU countries, for example with respect to food quality and environmental standards (Hudson & Hudson, 2008). These are representative of more general concerns reflected in the EU ICT Task Force Report (2006) which argues that the free movement of goods, people, services and capital is being 'inhibited by the market fragmentation created by regulatory incoherence'. For example, member states have failed to establish a common framework which

would allow technology companies to benefit from one set of standards and rules as, it is argued, is the case in the USA and Japan. Europe, it is argued, is still a patchwork of countries functioning under different regulatory systems. Furthermore, when member states implement an EU standard they adapt it, which reduces the advantage of uniformity in production and operation. These concerns have led to the growth of the EU's regulatory agencies and it may well be that in the future the need to see common application of standards will lead to a further expansion of EU power over that of the nation state.

CONCLUSIONS

Almost by definition, standards, in harmonising the European environment, facilitate the development of a European identity and hence integration. But the work of the ESOs in facilitating integration has gone far beyond this, although this impact has gone relatively unnoticed in the literature, possibly because of the technical nature of much of the process. Standardization impacts on the citizens, firms and consumers of the EU, arguably as much as other issues which temporarily at least receive more publicity. Many of the administrative costs and restrictions imposed on business stem from EU standardization, although some standards have also reduced business costs, of course. Many of the factors which determine consumer rights stem from standardization and many of the factors which determine an individual's quality of life are impacted upon by standards; increasingly these are EU standards in which the role of the nation state is declining. Indeed, it has been argued within a European context that the significant growth of supranational regulatory agencies, of which the ESOs and related institutions are a major part, represents a new mode of governance (Borras et al., 2007). Keleman (2003) has gone even further in arguing that these regulatory agencies comprise an emerging "fourth branch" in the EU's institutional structure to complement the executive, the legislature and the judiciary, whilst Majone (1996) argues that the EU is primarily a regulatory state and issuing rules is its most important vehicle for shaping public policy in Europe. Within this context, the ESOs are of particular importance because of their proactive role in developing and extending standards and because this development has been perhaps the critical factor in the growth of other EU regulatory bodies. The situation is a little complex as the ESOs are private international non-profit organisations, rather than public institutions. This is not unusual in standards; ISO and IEC are non-governmental organisations, whilst UNICE is regarded as an intergovernmental organisation. Most NSOs are also not in the public sector as such, but are often financed by the state and their

actual position is frequently somewhat unclear. More generally, this apparent private status is slightly unusual, given that they perform an important regulatory function within the EU and are also co-funded by the EU. One of the problems this then raises is one of accountability. In addition, Kerwer (2005) has argued that the very mechanism that turns voluntary standards into influential rules, that is expertise, also makes it hard for users to hold standard setters accountable.

The ESOs, with the exception of ETSI, are built on a system of NSOs, something which predates the New Approach and the role the ESOs have achieved since 1985. This has led to the ESOs being sandwiched between the NSOs on the one side and the European Commission and EU agencies on the other. This raises the potential for conflict with both ends of the sandwich. But in reality, the ESOs have absorbed leading personnel from the NSOs, particularly from DIN, the BSI and AFNOR. There is still the potential for conflict between the NSOs and the ESOs, not least because the NSOs have also to respond to national interests and pressures. But in reality the greater conflict is being played out, in a relatively quiet fashion, between the ESOs and the EU, with the NSOs somewhat sympathetic to the ESOs' position.

One interpretation of the new proposals by the European Commission is that in part they represent an attempt to gain greater control over the ESOs and to limit their potential for independent action. Setting the ESOs' targets and work plans the achievement of which will be linked to funding will implicitly, and perhaps also explicitly, bring the ESOs under greater control. To an extent this is a continuation of a long-standing process dating back to at least 1989 which started with the Commission's concern that there is a 'standards deficit' with a lack of standards in certain critical sectors and slow standards development in others (Egan, 1998). In part this is an almost inevitable consequence of the fragmented structure of an NSO-based process which does not sufficiently support unified policies. However, the extent to which the changes will work is open to question, particularly for ETSI for whom EU funding is a minority of its income. Care, too, needs to be exercised that in reforming the ESOs, their effectiveness is not reduced. To a large extent, and despite the qualifications that can be made, standards and standardization have been an EU success story at a time when such successes appear in short supply[16]. The successes have facilitated the development of EU industry and driven forward the

16 Of course, success in this context is a subjective concept and the question might be posed as to what 'failure' would look like. The answer is a situation where the NSOs and other stakeholders fail to reach agreement more often than not and where the technical standards delivered prove unfit for purpose. But success is also measured against the perceived failures of the EU on other dimensions such as reform of the Common Agricultural Policy.

framework which allows the single market to function. More than legislation, they have also provided a common environment in which EU citizens live their lives, giving the concept of being 'a European' some reality. The standards committees represent a forum where the different countries, firms and institutions work together in what is generally a co-operative and successful manner. And all of this has been achieved at very little cost, due to thousands of experts who give their time for free, often motivated by a sense of civic duty. It is crucial that this sense of civic duty is not damaged.

These new proposals are also designed to increase legitimacy, implicitly the legitimacy of the EU itself, and to increase the speed of standards delivery. The former has relatively recently become of particular relevance, as protecting the health and safety of Europeans as well as the European environment have been perceived as being critical "to the EU's legitimacy and its claim to represent the broader interests and concerns of Europeans" (Vogel, 2003). Standards have become a bridge between the EU and European citizens. The latter is important not only if *de jure* standards are not to be irrelevant in the face of *de facto* standards, but also to increase the competitiveness and innovativeness of European firms, something which is of fundamental importance at this point in history. There are, however, problems as to how one effectively represents such disparate groups as 'consumers' or 'SMEs' (Hudson & Orviska, 2011). Rural consumers, for example, have different concerns and attitudes to urban ones, young from old, and educated from the less well educated. The two aims, 'speed' and 'increasing stakeholder involvement', are not only extensive but also conflicting. One can implement some changes which help attain one objective without adversely impacting on the other. But the fundamental point is that given the framework, increasing the number of participants in standard development will almost inevitably slow the process down, particularly if new participants have substantially different preferences to existing ones. Egan (1998) cites earlier examples from the United States where attempts to increase the role of transparency and pluralism in administrative policies often made the process incredibly slow. It thus seems likely that compromises between speed and increasing participation will need to be made. But it need not, indeed should not, always be the same compromise. Fast standards are not necessarily better than slow standards if the former are done at the expense of "quality". Greater emphasis will be placed on speed in some cases and to widening participation in others. Speed will often be important for new technologies, e.g. IT, where *de facto* standards may be being developed and firms need certainty in order to progress with innovation as rapidly as possible. These considerations are less important in other cases such as health and the environment where it may be better to wait another six months to get 'the right

standard' and obtain wider public approval. Given the EU is overseeing the ESOs' performance, it would be better if this differential approach was made explicit.

Finally, let us speculate on possible developments in the next twenty years. Some trends are clear. Technology is becoming more complex and more interconnected, with platforms emerging which combine different technological advances. Standards will play an important part in facilitating this, although the nature of standards development may become more complex when dealing with cross-cutting technologies. Many new technological developments are in areas which cause public concern, e.g. biotechnology, and standards as part of the regulatory regime may continue to play an important role here. In a similar manner, standards can help repair the trust in businesses and banks which was damaged by the economic crisis, although it is largely the Basel guidelines which are of particular relevance for the latter. Globalisation, too, is likely to continue enhancing the role of international standards and in all probability the major standards bodies in Europe, Asia and elsewhere will enhance co-operation, which leaves open the question of how the United States will respond. All that suggests that standards will grow in importance. On the other side, the EU is evolving and the ESOs will find it difficult not to be affected by this evolution. There are pressures within the EU for an inner group of member states to forge a closer political union. Will these countries also develop a set of standards to fit their specific needs and will the outer countries retrieve some independence for their own NSOs? Or, not necessarily as an incompatible development, will standards continue to be the measure of soft governance which brings some form of harmonization to all EU countries?

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